Index to 1945 Transactions

A

Page

Acoustical Inspection Test for Castings 366
Advantages and Limitations of Gamma-ray Radiography on Small Steel Castings 102
Alloy:
  Castings, Density of Light 386
  Castings, Reduction of Microporosity in Magnesium . 180
  Iron Piston Rings, Typical Compositions of 50
  Microporosity, Cause and Control of Magnesium . . 54
Alloyed Cast Irons 290
Alloys:
  Comparison of the Common American and European Magnesium Casting 77
  Effect of Composition on Mechanical Properties of Sand Cast Copper-Tin-Lead-Zinc 213
  Effect of Gas on the Properties of Magnesium Sand Casting 272
  Grain Refinement of Magnesium Casting 352
  Heat Treatment of Magnesium 253, 272
  Mechanism of Microporosity in Magnesium 62
  Melting Magnesium 410
  Principles of Die Casting Magnesium 328
  Properties and Characteristics of Common Magnesium Casting 77
Aluminum Casting Stability:
  Heat Treatment 218
  Report 217
Analysis:
  Colorimetric Determination of Nickel and Chromium in a Combined Form of 324
  Combustion Method for Sulphur Determination in White Cast Iron 396
Annealing Temperatures for Cast Irons 289
Annular Porosity 56

B

Bentonite:
  Bonded Sands, Effect of Table Rise (Strain Rate) on Hot Strength of 413
  Southern and Western 347
Bibliography on:
  Casting Qualification in the Foundry 344
  Cast Iron Foundry Practice 53
  Colorimetric Determination of Nickel and Chromium in a Combined Form of Analysis 327
  Cumulative Curve for Foundry Sand Control . . . 75
  Density of Light Alloy Castings 391
  Die Casting Magnesium Alloys 332
  Effect of Gas on the Properties of Magnesium Sand Casting Alloys 282
  Elevated Temperature Tests in Sand Control . . . 323
  Equipment Trends in Precision Casting 247
  Gamma-ray Radiography 113
  Grain Refinement of Magnesium Casting Alloys . . 362
  Green Deformation and Sand Toughness in Sand Control 296
  Heat Treatment Study of Pearlitic Malleable Cast Iron 306
  Influence of Radiation Within Molding Sand on the Freezing Rate of Metal 162
  Magnesium Casting Alloys 127
  Microscope and Camera in the Study of Foundry Sand 228
  Molding Methods for Sand Castings 42
  Non-destructive Testing of Steel Castings 363
  Other Non-destructive Methods of Testing 368
  Properties and Characteristics of Common Magnesium Casting Alloys 86
  Reduction of Microporosity in Magnesium Alloy Castings 189
  Relative Effect of Lime and Dolomite Fluxes on Cupola Irons and Cupola Operation 199
  Solidification of Castings 101
  Solidification of Metals 35
  Split Type Specimen Tube for Elevated Temperature Sand Testing 252
  Steel for Castings—Methods of Production 340
"Black Light" Inspection for Casting Defects . . . 365, 386
Bonds (*See Clays and Sands*):
Brick Shapes for Cupola Refractories, Special 264
Bronze Weld Metallurgy 211
Briquetted Cast Iron Borings and Steel Turnings . . . 49
Burning in Magnesium 127

C

Camera in the Study of Foundry Sand, Microscope and 222
Carbide Stabilizers in Cast Irons 289
Carbon:
  Equivalent in Cast Iron 52, 286, 288
  Dioxide (Effect of) on Magnesium 275
Casting:
  Alloy, Effect of Gas on the Properties of Magnesium Sand 272
  Defects, Removal and Repair of Steel 190
  Equipment Trends in Precision 241
  Stability Report, Aluminum 217
  Technique, Magnesium Alloy 63
Castings:
  Aluminum Permanent Mold 389
  Density of Light Alloy 386
  Industrial Status of Precision 313
  Inspection of Steel 406
  Non-destructive Testing of Steel 363
  Radiography, Steel 141
  Reduction of Microporosity in Magnesium Alloy . . 180
  Repair Methods, Steel 307
  Should Always Be Qualified in the Foundry 342
  Studies on Solidification of 90
  Study of Molding Methods for Sound 36
  Welding Methods for Gray Iron 208
Cast Iron:
  Alloyed 290
  Creep Resistance of 287
  Foundry Practice, U. S. Wartime Developments . . 43
  High Strength 52
  Low Expansion 52
  Scab Formation in Castings 319
  Summary of High Temperature Applications of . . 284
  Thermal Shock Resistance of 289
  Typical Properties of 51
Cause and Control of Magnesium Alloy Microporosity . 54
Centrifugal Casting Methods, Committee Report on . . 292
Centrifugal Castings 46
Centrifuging Machine in Precision Casting 244
Ceramics in Precision Casting 243
Charpy Impact Strength of Magnesium 117
Chemical Analysis of Fluxes 197
Chemical Analysis of Slags 197
Chills, Effect of 31, 39, 152
Chills, Unfused 191
Chlorination of Magnesium in Premelting Pots 279
Chlorine (Effect of) on Molten Magnesium 276

Page

Chromium:
Bearing Cast Iron . . . 52
In a Combined Form of Analysis, Colorimetric Determination of Nickel and . . . 324
Clay:
A.F.A. Clay . . . 66
In Malleable Sand . . . 402
Selection of . . . 346
Cleanliness and Safety in the Foundry . . . 392
Colorimetric Determination of Nickel and Chromium in a Combined Form of Analysis . . . 324
Combustion Method for Sulphur Determination in White Cast Iron . . . 396
Committee Report on:
Aluminum Casting Stability . . . 217
Centrifugal Casting Methods . . . 292
Foundry Sand Research Project . . . 293
Heat Transfer . . . 87
High-Temperature Sand Testing—Fifth Annual Progress Report . . . 175
Steel for Castings—Methods of Production . . . 339
1944-45 Sintering Test . . . 377
Comparison of the Common American and European Magnesium Casting Alloys . . . 114
Composition of Alloy Iron Piston Rings, Typical . . . 50
Composition and Mechanical Properties of Sand Cast Copper-Tin-Lead-Zinc Alloys, Effect of . . . 213
Conductivity:
Of Sand . . . 100
Thermal, of Steel . . . 99
Control:
In a Malleable Iron Foundry, Sand . . . 336
Malleable Iron . . . 229
Malleable Sand Control in a Large Mechanized Foundry . . . 398
Malleable Sand Control, Summary of Questionnaire . 266
Controlled Progressive Solidification, Principle of . . . 36
Converter (Side Blown) in Steel Production . . . 339
Core Oil in Malleable Sand . . . 402
Correlation of Staff and Line Operations . . . 128
Corrosion of Magnesium . . . 79, 123
Creep Resistance of Cast Iron . . . 287
Cumulative Curve Defined . . . 67
Cumulative Curve for Foundry Sand Control, Use of the 66
Cupola Charging Materials . . . 49
Cupola Refractories, Special Brick Shapes for . . . 264

D

Deep-freeze Treatment for Aluminum Castings . . . 217
Defects:
Chipping of . . . 307
Grinding of . . . 308
Removal and Repair of Steel Casting . . . 190
Deformation vs.:
Green Strength of Sand . . . 298
Sea Coal in Sand . . . 299
Dendrite Forms . . . 63
Density of Light Alloy Castings . . . 386
Density of Steel . . . 100
Describes Improved Methods in Making Match Plates of Plaster Composition . . . 258
Design of:
Core Dryers and Core Plates . . . 375
Die Casting Dies . . . 329
Design, Redesign and Interchangeability, Pattern and Allied Equipment . . . 369
Die Casting:
Alloys . . . 328
Equipment and Materials . . . 329
Machining and Finishing . . . 332
Operating Practice . . . 329

Page

Operation Timing . . . 331
Quality Control . . . 331
Sizes and Tolerances . . . 332
Sludge Removal . . . 330
X-ray Inspection . . . 331
Die Casting Magnesium Alloys, Principles of . . . 328
Dimensional Tolerances in Precision Casting . . . 316
Directional Solidification . . . 47
Dolomite Fluxes on Cupola Irons and Cupola Operation, Relative Effect of Lime and . . . 196
Draw Straps on Large Patterns . . . 170
D. T. D. Bar . . . 54
Durability of Synthetic Sand . . . 346

E

Effect of:
Chills . . . 31
Composition on Mechanical Properties of Sand Cast Copper-Tin-Lead-Zinc Alloys . . . 213
Gas on the Properties of Magnesium Sand Casting Alloys . . . 272
Table Rise (Strain Rate) on Hot Strength of Bentonite Bonded Sands . . . 413
Electric Melting in the Ferrous Foundry, Refractories for 379
Elevated Temperature:
Molding Sand Properties at . . . 200
Sand Testing, Split Type Specimen Tube for . . . 248
Tests in Sand Control . . . 319
Equipment Trends in Precision Casting . . . 241

F

Fatigue Life of Magnesium . . . 79, 119
Feeder:
Blind . . . 37
Capacity . . . 38
Connections . . . 38
Design, Effective . . . 37
Williams . . . 37, 38
Flame Gouging of Casting Defects . . . 192
Flour in Malleable Sand . . . 402
Flux:
Composition . . . 55, 197
(Influence of) on Gas Porosity of Magnesium . . . 279
Foundry:
Considerations of Magnesium Alloys . . . 84
Industry, Post-War Outlook for the . . . 294
Patterns in the Jobbing . . . 168
Practice (Cast Iron), U. S. Wartime Developments . 43
Fourier's Law Defined . . . 1
Free Energy Defined . . . 2
Freezing Range of Steel . . . 100
Freezing Rate of Metal, Influence of Radiation Within Molding Sand on the . . . 159
Furnace:
Direct-Arc, Roof Construction . . . 382
Direct-Arc, Bottom, Sidewalls, Door, Arches and Jambs 383
High-Frequency Induction . . . 384
Open Muffle Electric . . . 302
Fusion Welding, Advantages . . . 209

G

Gain-Sharing System of Wage Incentive . . . 236
Gamma-Ray:
Emission . . . 334
Radiography—Its Advantages and Disadvantages . . 333
Radiography on Small Steel Castings, The Advantages and Limitations of . . . 102
Gas:
Content of Liquid Metal . . . 17
Effect of, on Solidifying Magnesium . . . 56
Effect of, on the Properties of Magnesium Sand Casting Alloys . . . 272

Page

Porosity, Influence of Flux on . . . 279
Gate Design . . . 36
Gates and Feeders, Position of . . . 36
Grain Refinement of Magnesium Casting Alloys 352, 355, 357
Grain Size:
Effect of, upon Microporosity of Magnesium . . 355
Of Steel for Castings . . . 340
Graphitization . . . 340
Gray Iron:
Castings, Weld Methods for . . . 208
In High Temperature Operations, Increased Use of . 283
Wear Resistance . . . 394
Green Compression Strength of Sand . . . 204
Green Deformation and Sand Toughness in Sand Control, Some Aspects of . . . 296

H

Hardenability, Steel Castings . . . 340
Heat of Fusion of Steel . . . 100
Heat Transfer . . . 1
Heat Transfer Committee Report . . . 87
Heat Treatment:
Of Magnesium Alloys . . . 253, 272
Of Magnesium Castings . . . 84
Study of Pearlitic Malleable Cast Iron . . . 301
Helium (Effect of) on Molten Magnesium . . . 274, 280
High Temperature:
Applications of Cast Iron, Summary of . . . 284
Operations, Increased Use of Gray Cast Iron in . . 283
Sand Testing—Fifth Annual Progress Report . . . 175
Hot Strength of Bentonite Bonded Sands, Effect of Table Rise (Strain Rate) on . . . 413
Hydrogen:
Effect of, on Molten Magnesium . . . 273, 280
Porosity . . . 58
Removal from Melt by Fluxing Gas . . . 186
Solubility in Magnesium . . . 183
Hydrometer Method Procedure . . . 73

I

Incentives, Sound Wage . . . 236
Increased Use of Gray Cast Iron in High Temperature Operations . . . 283
Industrial:
Engineering Defined . . . 128
Engineering Programs, Plant Management's Part in . 128
Status of Precision Castings . . . 313
Influence of Radiation Within Molding Sand on the Freezing Rate of Metal . . . 159
Inoculation:
Ladle . . . 287
Mechanism of . . . 51
Inoculants, Some Typical Analyses of Ladle . . . 52
Inspection of Steel Castings . . . 406
Interchangeability, Pattern and Allied Equipment—Design, Redesign and . . . 369
Investing the Pattern in Precision Casting . . . 243
Investment Casting Defined . . . 313
Isothermal Transformation Heat Treatment of Malleable Iron . . . 302

J

Jobbing Foundry, Patterns in the . . . 168

K

Kiln (*See Furnace*):

L

Ladle:
Inoculants, Some Typical Analyses of . . . 52

Page

Inoculation . . . 287
Latent Heat of Fusion . . . 11
Light Alloy Castings, Density of . . . 386
Lime and Dolomite Fluxes on Cupola Irons and Cupola Operation, Relative Effect of . . . 196
Low Expansion Cast Irons . . . 52

M

Magnesite Refractories . . . 380
Magnesium:
Alloy Casting Technique . . . 63
Alloy, Foundry Considerations . . . 84
Cause and Control of Magnesium Alloy Microporosity 54
Comparison of the Common American and European Magnesium Casting Alloys . . . 114
Grain Refinement of Magnesium Casting Alloys . . 352, 353
Heat Treatment of Magnesium Alloys . . . 253, 272
Heat Treatment of Magnesium Castings . . . 84
Mechanism of Microporosity in Magnesium Alloys . 62
Melting Magnesium Alloys . . . 410
Principles of Die Casting Magnesium Alloys . . . 328
Properties and Characteristics of Common Magnesium Casting Alloys . . . 77
Reduction of Microporosity in Magnesium Alloy Castings . . . 180
Sand Casting Alloys, Effect of Gas on the Properties of 272
Magnetic Particle Inspection of Welded Steel Castings 309, 409
Malleable:
Cast Iron, Heat Treatment Study of Pearlitic . . . 301
Iron Control . . . 229
Iron Foundry, Sand Control in a . . . 336
Sand Control in a Large Mechanized Foundry . . . 398
Sand Control, Summary of Questionnaire . . . 266
Management, Are You Accepting Your Responsibility? . 140
Match Plates of Plaster Composition, Describes Improved Methods in Making . . . 258
Measurement of Temperature Gradient During Solidification of Magnesium . . . 60
Mechanical Properties of Sand Cast Copper-Tin-Lead-Zinc Alloys, Effect of Composition on . . . 213
Mechanism of:
Inoculation . . . 51
Microporosity Formation . . . 188
Mechanized Foundry, Malleable Sand Control in a Large 398
Metal Melting and Distribution . . . 48
Melting Magnesium Alloys . . . 54, 120, 410
Metals, Solidification of . . . 1
Methods:
Employed to Obtain Rates of Solidification . . . 88
For Welding Gray Iron Castings . . . 208
For Sulphur Determination in White Cast Iron, Combustion . . . 396
Of Modifying Solidification Rates for Magnesium . . 59
Of Testing, Other Non-destructive . . . 365
Of Production, Steel for Castings . . . 339
Steel Castings Repair . . . 307
Committee Report on Centrifugal Casting . . . 292
In Making Match Plates of Plaster Composition, Describes Improved . . . 258
Microporosity:
Cause and Control of Magnesium Alloy Microporosity 54
Mechanism of Microporosity in Magnesium Alloys 62, 188
Practical Methods of Measuring Degree of . . . 181
Reduction of Microporosity in Magnesium Alloy Castings . . . 180
Microscope and Camera in the Study of Foundry Sand . 222
Molding:
A Study of Molding Methods for Sand Castings . . 36
Materials . . . 54
Machine Types . . . 45
Sand Properties at Elevated Temperatures . . . 200
Mold Preparation . . . 88

N

Page

Natural Gas (Effect of) on Molten Magnesium . . . 274
Neutral Refractories . . . 380
Nickel:
And Chromium in a Combined Form of Analysis, Colorimetric Determination of . . . 324
Bearing Cast Iron . . . 52
Nitrogen (Effect of) on Molten Magnesium . . . 275
Nomographic Chart Showing Temperatures, Settling Time, and Sand Particle Size Relationship . . . 74
Non-destructive Testing of Steel Castings . . . 363
Non-ferrous Foundries, Synthetic Sand in . . . 345

O

Other Non-destructive Methods of Testing . . . 365
Ovens (*See Furnace*)
Oxygen (Effect of) on Molten Magnesium . . . 275

P

Pattern:
And Allied Equipment—Design, Redesign and Interchangeability . . . 369
Assembly in Precision Casting . . . 245
Draft . . . 170
In the Jobbing Foundry . . . 168
Redesign for Increased Production . . . 349
Types . . . 172
Pearlitic Malleable Cast Iron, Heat Treament Study of . 301
Permeability Control . . . 404
Phase Diagrams . . . 7
"Photo Position Finding" . . . 163
Pin-hole Porosity . . . 388
Piston Rings, Typical Compositions of Alloy Iron . . 50
Plant Management's Part in Industrial Engineering Programs . . . 128
Plaster Composition, Describes Improved Methods in Making Match Plates of . . . 258
Porosity:
Annular . . . 56
Caused by Hot Spots . . . 40
Form and Distribution . . . 55
Hydrogen . . . 58
Precision Casting:
Equipment Trends in . . . 241
Industrial Status of . . . 313
Surface Finishes . . . 316
Pressure Testing of Castings . . . 366
Principles of Die Casting Magnesium Alloys . . . 328
Properties and Characteristics of Common Magnesium Casting Alloys . . . 77
Properties of:
Cast Irons . . . 51
Magnesium Sand Casting Alloys, Effect of Gas on the . 272

Q

Quench and Temper Treatment of Malleable . . . 302
Questionnaire, Malleable Sand Control, Summary of . 266

R

Radiation Within Molding Sand on the Freezing Rate of Metal, Influence of . . . 159
Radiography:
Gamma-Ray, Its Advantages and Disadvantages . . 333
On Small Steel Castings, The Advantages and Limitations of Gamma-Ray . . . 102
Steel Castings . . . 141
Terminology in . . . 146
Rates of Solidification, Methods Employed to Obtain . 88

Page

Reclamation, Sand . . . 131
Reduction of Microporosity in Magnesium Alloy Castings 180
Refractories:
For Electric Melting in the Ferrous Foundry . . . 379
Neutral . . . 380
Special Brick Shapes for Cupola . . . 264
Refractory Failures . . . 379
Relative Effect of Lime and Dolomite Fluxes on Cupola Irons and Cupola Operation . . . 196
Removal and Repair of Steel Casting Defects . . . 190
Removal of Hydrogen from Melt with Fluxing Gas . . 186
Repair Methods, Steel Castings . . . 307
Residual Stresses in Welded Steel Castings . . . 311

S

Safety in the Foundry, Cleanliness and . . . 392
Sand:
Cast Copper-Tin-Lead-Zinc Alloys, Effect of Composition on Mechanical Properties of . . . 213
Casting Alloys, Effect of Gas on the Properties of Magnesium . . . 272
Core, Comparison of New and Reclaimed . . . 138
Effect of Table Rise (Strain Rate) on Hot Strength of Bentonite Bonded . . . 413
Fineness Computation . . . 66
Grain Shapes . . . 135, 206, 225
In Non-ferrous Foundries, Synthetic . . . 345
Microscope and Camera in the Study of Foundry . . 222
Mold Drying with Propane-Gas Torches . . . 415
Naturally Bonded, Advantages and Disadvantages . . 348
Processing Equipment . . . 267
Properties at Elevated Temperatures, Molding . . . 200
Quality . . . 132
Reclamation . . . 131
Reclamation Defined . . . 132
Refractory, Mold and Core Materials . . . 45
Research Project, Committee Report on Foundry . . 293
Specifications . . . 268
Storage . . . 132
Synthetic Bonded, Advantages and Disadvantages . . 348
Testing, High Temperature—Fifth Annual Progress Report . . . 175
Testing, Split Type Specimen Tube for Elevated Temperature . . . 248
Toughness in Sand Control, Some Aspects of Green Deformation and . . . 296
1944-45 Sintering Test, Committee Report . . . 377
Sand Control:
In a Large Mechanized Foundry, Malleable . . . 398
In a Malleable Iron Foundry . . . 336
Elevated Temperature Tests in . . . 319
Some Aspects of Green Deformation and Sand Toughness in . . . 296
Summary of Questionnaire, Malleable . . . 266
Test Sheet, Daily . . . 299
Use of the Cumulative Curve for Foundry . . . 66
Sand Testing:
High Temperature—Fifth Annual Progress Report . 175
Split Type Specimen Tube for Elevated Temperature . 248
Scab Formation in Castings . . . 319
Sea Coal in Malleable Sand . . . 338, 399, 402, 405
Secondary Radiation of X-rays . . . 145, 335
Silica, Properties of . . . 379
Sintering Test (1944-45), Committee Report . . . 377
Solidification of:
Castings, Studies on . . . 90
Magnesium and Aluminum-Base Alloys, Mode of . . 59
Metals . . . 1
Solubility of Hydrogen in Molten Magnesium . . . 183
Some Aspects of Green Deformation and Sand Toughness in Sand Control . . . 296

Page

Sound Castings, A Study of Molding Methods for . . 36
Sound Wage Incentives 236
Special Brick Shapes for Cupola Refractories 264
Specific Heat of:
  Sand 100
  Steel 99
Split Type Specimen Tube for Elevated Temperature Sand Testing 248
Stability Report, Aluminum Casting 217
Steel Castings:
  Inspection of 406
  Radiography 141
  Repair Methods 307
Steel for Castings—Methods of Production 339
(Strain Rate) on Hot Strength of Bentonite Bonded Sands, Effect of Table Rise 413
Stress Relief Treatment for Weldments 195, 312
Stress-strain Curves for Sand Mixtures 179
Sulphur Determination in White Cast Iron, Combustion Method for 396
Sulphur Dioxide (Effect of) on Molten Magnesium . . 275
Summary of Questionnaire, Malleable Sand Control . . 266
Superheating Magnesium Alloys 353, 411
Supersonic Casting Inspection Test 366
Surface Tension 16
Synthetic Sand:
  Durability 346
  In Non-ferrous Foundries 345

T

Table Rise (Strain Rate) on Hot Strength of Bentonite Bonded Sands, Effect of 413
Tensile-Impact Values for Magnesium Alloys 117
Test for the Presence of Gas in Molten Magnesium . . 57

Page

Testing:
  Of Steel Castings, Non-destructive 363
  Other Non-destructive Methods of 365
Thermal:
  Conductivity of Steel 99
  Properties per Unit Volume of Magnesium Compared with Other Metals 60
  Shock Resistance of Cast Iron 289
Toughness vs. Permeability of Sand 299

U

Unfused Chills 191
Use of Gray Cast Iron in High Temperature Operations, Increased 283

V

Venting Mold Cavities 40
Viscosity of Liquid Metals 15

W

Wage Incentives, Sound 236
Wartime Developments (U. S.), Cast Iron Foundry Practice 43
Water Vapor (Effect of) on Molten Magnesium . . . 274
Wear Resistance, Gray Iron 394
Welding:
  Electric 310
  Gas 310
  Thermit 310
Welding Methods:
  For Gray Iron Castings 208
  In Steel Casting Defects Repair 193
Weldment Stress Relief Treatment 195
White Cast Iron, Combustion Method for Sulphur Determination in 396